

We claim:

1. A portable power generator, comprising an engine composed of a light alloy material and having a flywheel, and an alternator operatively associated with the flywheel to form an integrated unit with the engine.

2. The generator of claim 1, wherein an engine cowling is provided to function as at least two of a fan shroud, a fan scroll, a distributor to cool the engine and the alternator, an electronic cold plate and one or more coolant ducts.

3. The generator of claim 1, wherein the distributor function of the engine cowling separates air flow to cool an engine head and cylinder wall of the engine as well as an oil sump.

4. The generator of claim 1, wherein the engine is an internal combustion engine.

5. The generator of claim 1, wherein the alternator is the sole component driven by the engine.

6. The generator of claim 1, wherein the engine includes an engine block and an engine block cover.

7. The generator of claim 1, wherein the light alloy material is a magnesium alloy.

8. The generator according to claim 6, wherein the engine further includes an engine head composed at least in part of a high temperature material.

9. The generator according to claim 1, wherein the alternator includes a cooling fan.

10. The generator according to claim 9, wherein the cooling fan is selected from the group consisting of a centrifugal fan, an axial fan and a mixed-flow fan.

11. The generator according to claim 10, wherein an engine cowling is provided to function as at least two of a fan shroud, a fan scroll, a distributor to cool the engine and the alternator, an electronic cold plate and one or more coolant ducts.

12. The generator according to claim 11, wherein the distributor function of the engine cowling separates air flow to cool an engine head and cylinder wall of the engine as well as an oil sump.

13. The generator according to claim 11, wherein a fan shroud for the cooling fan is operatively associated with the engine cooling to force air through the engine cowling.

14. The generator according to claim 9, wherein the cooling fan provides a mechanical link between an inertia component and a mounting portion of the flywheel.

15. The generator according to claim 14, wherein a lightweight alloy in the cooling fan constitutes the mechanical link and magnetic materials of the alternator's rotor provides the inertia component.

16. The generator according to claim 1, wherein the alternator is a permanent magnet alternator.

17. The generator according to claim 16, wherein the alternator and flywheel constitute a two-piece construction.

18. The generator according to claim 16, wherein the alternator is a radial gap, twelve-pole alternator.

19. The generator according to claim 18, wherein the alternator and flywheel constitute a two-piece construction.

20. The generator according to claim 1, wherein means is provided for converting alternating current produced by the alternator into direct current.

21. The generator according to claim 20, wherein the converting means comprises prepackaged rectifiers.

22. The generator according to claim 20, wherein an engine cowling is provided to function as at least two of a fan shroud, a fan scroll, a distributor to cool the engine and the alternator, an electronic cold plate and one or more coolant ducts.

23. The generator according to claim 22, wherein the distributor function of the engine cowling separates air flow to cool an engine head and cylinder wall of the engine as well as an oil sump.

24. The generator according to claim 23, wherein at least one coolant duct is associated with the oil sump which includes fins in the duct channel to enhance cooling.

25. The generator according to claim 22, wherein the converting means is arranged at the engine cowling.

26. The generator according to claim 20, wherein the alternator is configured to produce three-phase power in parallel circuits.

27. The generator according to claim 26, wherein the converting means comprise full-wave rectifiers.

28. The generator according to claim 27, wherein an engine cowling is provided to function as at least two of a fan shroud, a fan scroll, a distributor to cool the engine and the alternator, an electronic cold plate and one or more coolant ducts.

29. The generator according to claim 28, wherein the converting means is arranged at the engine cowling.

30. The generator according to claim 1, wherein a backpack mounting is provided for the engine and alternator.

31. The generator according to claim 30, wherein the engine and alternator are configured to produce a power output of up to about 5 kW.

32. The generator according to claim 1, wherein a rollcage mounting is provided for the engine and alternator.

33. The generator according to claim 32, wherein the engine and alternator are configured to produce a power output of up to about 15 kW.